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**(54) Cleaning and freshening unit intended for suspension from a rim of a toilet bowl**

Reinigungs- und Erfrischungsvorrichtung zum Einhängen am Rand eines Toilettenbeckens

Dispositif de nettoyage et de rafraîchissement destiné à être accroché sous le rebord d'une cuvette de W.C.

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EP 0 785 315 B1

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**Description**

[0001] The invention relates to a cleaning and freshening unit according to the preamble of claim 1.

[0002] Such a unit is known from European patent application EP-A-0 538 957. A drawback of the known cleaning and freshening unit is that as the liquid level in the liquid reservoir falls it dispenses less liquid to the porous mass per unit of time. As a result thereof, the freshening action of the unit will decrease as the liquid level in the bottle falls.

[0003] Another drawback of the known device is that the bottle communicates with the ambient air only via the porous mass. Therefore, the ambient air can only flow into the bottle with difficulty, so that there is a risk of reduced pressure being formed in the bottle which substantially limits the draining of the bottle. This effect, too, leads to a reduced release of liquid per unit of time as the liquid level in the bottle falls.

[0004] The object of the invention is to provide a cleaning and freshening unit of the type mentioned in the opening paragraph which does not have the above-mentioned drawbacks.

[0005] To this end, the cleaning and freshening unit is characterized by the steps defined in the characterizing part of claim 1.

[0006] As a result of the suitably selected sizes of the at least one liquid passage opening and the at least one air supply opening it is achieved that the liquid pressure on the porous mass is always substantially equal and independent of the liquid level in the liquid reservoir. In general, the liquid passage openings will have larger sizes than the air supply openings. The air supply openings must be so small that as a result of the viscosity and the surface tension of the liquid therethrough, at least under normal conditions, no liquid discharges.

[0007] The liquid pressure on the porous mass always being substantially equal and independent of the liquid level in the liquid reservoir, a constant saturation of the porous material will be effected during the whole service life of the bottle.

[0008] As a result of temperature fluctuations the pressure in the liquid reservoir can rise above the atmospheric pressure. Thus, there is the possibility of liquid being forced outwards and flowing away via the air supply openings. Once this effect has occurred, the flow can be maintained under certain conditions as a result of capillary action. This may lead to draining of the bottle within a short time.

[0009] The chamber must of course be of such construction that liquid flowing in the chamber is not drawn away by capillary action, at least can only via the porous mass leave the chamber or be drawn back into the bottle. Consequently, the drawbacks of the known unit have been removed with the cleaning and freshening unit according to the invention.

[0010] According to a further elaboration on the invention the cleaning and freshening unit is characterized by

the steps of claim 2.

[0011] The volume of the chamber being so large that the volume variations occurring as a result of temperature fluctuations of air contained in the liquid reservoir can be taken up herein, it is achieved that liquid will never flow out of the chamber via the ventilation openings.

[0012] Further elaborations on the invention are described in the subclaims and will be explained in more detail by means of two examples of embodiment, with reference to the accompanying drawings in which

Fig. 1 is a cross-sectional view of an example of embodiment of a cleaning and freshening unit taken along the line I-I of Fig. 2;

Fig. 2 is a cross-sectional view taken along the line II-II of Fig. 1;

Fig. 3 shows the separate bottle forming part of the cleaning and freshening unit in closed condition; and

Fig. 4 shows a cleaning and freshening unit having a chamber provided with a bottom.

[0013] The cleaning and freshening unit 1 shown is provided with a holder 2 and a bottle 3 detachably connected to the holder 2 and comprising a liquid reservoir 4. The unit 1 is provided with suspension means 5 for suspending the unit 1 from a rim of a toilet bowl not shown. The unit is also provided with a porous liquid-absorbing mass 6 which always communicates with liquid F contained in the liquid reservoir 4. The porous mass 6 is arranged in the holder 2 so as to be located in a path of the flushing water when the unit 1 is suspended from the rim of the toilet bowl. The porous mass 6 may be, e.g., a sponge or a plate of sintered porous material.

[0014] The holder 2 is provided with a connecting nipple 7 suitable for connection to a discharge opening 8 of the bottle 3, so that when the unit 1 is suspended from the rim of the toilet bowl the discharge opening 8 is directed downwards. Of course, the bottle 3 is of such construction that the discharge opening 8 is located at the lowermost point of the bottle 3, so that all liquid F can flow from the liquid reservoir 4 outwards via the discharge opening 8.

[0015] According to the invention the discharge opening 8 of the bottle 3 when connected to the connecting nipple 7 is partly closed by a closing wall 9 provided with at least one liquid passage opening 10 which opens into an inlet 11a of a channel 11 abutting with an outlet 11b having a limited surface against the porous mass 6, and provided with at least one air supply opening communicating with the ambient pressure. The sizes of the at least one liquid passage opening 10 and the at least one air supply opening are so adjusted to each other and to the viscosity of the liquid F contained in the liquid reservoir 4 that the liquid pressure on the porous mass 6 is always substantially equal and independent of the liquid level in the liquid reservoir 4.

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[0016] In the present example of embodiment the air supply openings 12 communicate with the ambient pressure via a chamber 13 provided on the side facing upwards with at least one ventilating opening 14. Preferably, the volume of the chamber 13 is such that it can take up at least the volume variations occurring as a result of temperature fluctuations in air contained in the liquid reservoir 4. Thus, liquid is prevented from flowing outwards and being lost owing to a rise in the pressure in the liquid reservoir 4. Moreover, the liquid reservoir 4 is prevented from continuing to drain as a result of capillary action, so that the liquid reservoir 4 would be empty within a short time. The ventilation openings 14 are preferably located at a higher level than the air supply openings 12. When the air pressure in the liquid reservoir 4 falls, a portion of the liquid contained in the chamber 13 is drawn back again into the liquid reservoir 4. This drawing back will continue until the liquid level in the chamber has fallen so much that there is again a direct air communication between the ventilation opening 14 and the air supply openings 12.

[0017] As clearly shown in Figs. 1 and 2, the holder 2 is made of a first moulded piece of which the suspension means 5 form part as well. In Figs. 1 and 2 it is moreover clearly visible that the connecting nipple 7, the closing wall 9, the at least one liquid passage opening 10, the at least one air supply opening 12, the channel 11, and the walls 15 bounding the chamber 13 form part of a second moulded piece detachably connected to the first moulded piece via a snap connection 16. The porous mass 6 is fixed between the first moulded piece and the second moulded piece. In the present example of embodiment the porous mass is a plate-shaped element of sintered material.

[0018] As is clearly shown in Fig. 3, the discharge opening 8 of the bottle 3 is closed by a closing cap 17 provided with a first cap portion 17a and a second cap portion 17b. The second cap portion 17b is of such construction that when the bottle is placed on the holder 2 this second cap portion is pressed by a projection 18 provided on the holder 2 into the liquid reservoir 4, so that the bottle 3 is opened and the discharge opening 8 is formed. Thus, it is achieved that when the bottle 3 is placed in the holder 2 the bottle is opened simultaneously. The second cap portion 17b preferably has a specific mass smaller than that of the liquid F, so that it begins to float. It is self-evident that the bottle 3 with the liquid F contained therein will be separately available. The bottle 3 and the holder 2 are provided with projections 19 and grooves 20 which cooperate with each other in a manner such that the bottle 3 can be snapped on the holder 2. Moreover, the holder 2 is provided with a number of slots 21 which increase the access of flushing water to the porous mass 6 and, moreover, give the ambient air free passage to the porous mass 6, which enhances the evaporation of the volatile substances in the liquid and the spreading of the substances. In a flushing operation a portion of the active liquid F contained in the

porous mass 6 will enter the flushing water and performing its cleaning action therein, while after the flushing operation a portion of the active substance evaporates from the porous mass 6 and effects the freshening action on the surroundings.

[0019] It is clear that the invention is not limited to the example of embodiment shown but that various modifications are possible within the scope of the invention. Thus, for instance, the shape of the holder may be different and may, as shown in Fig. 4, be provided with a bottom 22, which further reduces the risk of flowing away of the liquid F. Moreover, it is possible that the bottle 3 is provided with another type of cap which must be removed before placing the bottle 3 in the holder 2.

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### Claims

1. A cleaning and freshening unit (1) provided with a holder (2) and a bottle (3) detachably connected to the holder (2) and comprising a liquid reservoir (4), said unit (1) being provided with suspension means (5) for suspending the unit (1) from a rim of a toilet bowl, said unit (1) also being provided with a porous, liquid-absorbing mass (6) which always communicates with liquid (F) contained in the liquid reservoir (4), said porous mass (6) being arranged in the holder (2) so as to be located in a path of the flushing water when the unit (1) is suspended from the rim of the toilet bowl, said holder being provided with a connecting nipple (7) suitable for connection to a discharge opening (8) of the bottle (3), so that when the unit (1) is suspended from the rim of the toilet bowl the discharge opening (8) is directed downwards, characterized in that the discharge opening (8) of the bottle (3) when connected is partly closed by a closing wall (9) provided with at least one liquid passage opening (10) which opens into an inlet (11a) of a channel (11) abutting with an outlet (11b) having a limited surface against the porous mass (6), and provided with at least one air supply opening (12) communicating with the ambient pressure, the sizes of the at least one liquid passage opening (10) and the at least one air supply opening (12) being so adjusted to each other and to the viscosity of the liquid (F) contained in the liquid reservoir (4) that the liquid pressure on the porous mass (6) is always substantially equal and independent of the liquid level in the liquid reservoir (4), and in that the air supply openings (12) communicate with the ambient pressure via a chamber (13) provided on a side facing upwards with at least one ventilating opening (14).
2. A cleaning and freshening unit according to claim 1, characterized in that the volume of the chamber (13) is such that at least the volume variations occurring as a result of temperature fluctuations in air

- contained in the liquid reservoir (4) can be taken up herein.
3. A cleaning and freshening unit according to any of the preceding claims, characterized in that the holder (2) is made of a first moulded piece of which the suspension means (5) form part as well. 5
4. A cleaning and freshening unit according to at least claims 2 and 4, characterized in that the connecting nipple (7), the closing wall (9), the at least one liquid passage opening (10), the at least one air supply opening (12), the channel (11), and the walls (15) bounding the chamber (13) form part of a second moulded piece detachably connected to the first moulded piece via a snap connection (16). 10
5. A cleaning and freshening unit according to claim 5, characterized in that the porous mass (6) is fixed between the first and the second moulded piece. 15
6. A cleaning and freshening unit according to any of the preceding claims, characterized in that the discharge opening (8) of the bottle (3) is closed by a closing cap (17) provided with a first cap portion (17a) and a second cap portion (17b), said second cap portion (17b) being of such construction that when the bottle (3) is placed on the holder (2) said second cap portion (17b) is pressed by a projection (18) provided on the holder (2) into the liquid reservoir (4), so that the bottle (3) is opened and the discharge opening (8) is formed. 20
- Patentansprüche**
1. Eine Reinigungs- und Auffrischungseinheit (1) versehen mit einem Halter (2) und einer Flasche (3), die lösbar mit dem Halter (2) verbunden ist und ein Flüssigkeitsreservoir (4) aufweist, wobei die Einheit (1) mit einer Aufhängungsvorrichtung (5) zum Aufhängen der Einheit (1) an den Rand einer Toilettenschüssel versehen ist, wobei die Einheit (1) außerdem mit einer porösen, flüssigkeitsabsorbierenden Masse (6) versehen ist, die in ständiger Verbindung mit der Flüssigkeit (F) steht, welche sich in dem Flüssigkeitsreservoir (4) befindet, wobei die poröse Masse (6) in dem Halter (2) so angeordnet ist, daß sie sich in einem Weg des Spülwassers befindet, wenn die Einheit (1) am Rand der Toilettenschüssel aufgehängt ist, wobei der Halter mit einem Verbindungsnißel (7) versehen ist, geeignet, eine Verbindung zu einer Ausflußöffnung (8) der Flasche (3) herzustellen, so daß die Ausflußöffnung (8) nach unten zeigt, wenn die Einheit (1) an dem Rand der Toilettenschüssel aufgehängt ist, und dadurch gekennzeichnet ist, daß die Ausflußöffnung (8) der Flasche (3), wenn die Verbindung hergestellt ist, teilweise durch eine Schließwand (9) verschlossen ist, die mit mindestens einer Flüssigkeitsdurchgangsöffnung (10) versehen ist, welche sich zu einem Einlaß (11a) eines Kanals (11) öffnet, der mit einem Auslaß (11b) auf einer begrenzten Oberfläche der porösen Masse (6) anliegt, und mit mindestens einer Luftzufuhröffnung (12) versehen ist, die mit dem Umgebungsdruck in Verbindung steht, wobei die Größe der mindestens einen Flüssigkeitsdurchlaßöffnung (10) und der mindestens einen Luftzufuhröffnung (12) so aufeinander und mit der Viskosität der Flüssigkeit (F), die sich in dem Flüssigkeitsreservoir (4) befindet, abgestimmt sind, daß der Flüssigkeitsdruck auf die poröse Masse (6) immer im wesentlichen gleich und unabhängig von der Flüssigkeitsgrenze in dem Flüssigkeitsreservoir (4) ist, und dadurch gekennzeichnet ist, daß die Luftzufuhröffnung (12) mit dem Umgebungsdruck über eine Kammer (13) in Verbindung steht, die auf der Oberseite mit mindestens einer Lüftungsöffnung (14) versehen ist. 25
2. Eine Reinigungs- und Auffrischungseinheit (1) entsprechend Anspruch 1, dadurch gekennzeichnet, daß das Volumen der Kammer (13) so bemessen ist, daß mindestens die durch Temperaturschwankungen auftretende Volumenänderungen der sich im Flüssigkeitsreservoir (4) befindlichen Luft darin aufgenommen werden können. 30
3. Eine Reinigungs- und Auffrischungseinheit (1) nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß der Halter (2) aus einem ersten Formstück hergestellt ist, dessen Bestandteil auch die Aufhängungsvorrichtung (5) ist. 35
4. Eine Reinigungs- und Auffrischungseinheit (1) nach mindestens Anspruch 1 und 3, dadurch gekennzeichnet, daß das Verbindungelement (7), die Schließwand (9), die mindestens eine Flüssigkeitsdurchgangsöffnung (10), die mindestens eine Luftzufuhröffnung (12), der Kanal (11), und die die Kammer (13) begrenzenden Wände (15) Bestandteil eines zweiten Formstück sind, welches lösbar mit dem ersten Formstück durch eine Schnappverbindung (16) verbunden ist. 40
5. Eine Reinigungs- und Auffrischungseinheit (1) nach Anspruch 4, dadurch gekennzeichnet, daß die poröse Masse (6) zwischen dem ersten und zweiten Formstück befestigt ist. 45
6. Eine Reinigungs- und Auffrischungseinheit (1) nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß die Ausflußöffnung (8) der Flasche (3) durch eine Schließkappe (17) verschlossen ist, die mit einem ersten Kappenteil (17a) und einem einem zweiten Kappenteil (17b) ver-

hen ist, wobei das zweite Kappenteil (17b) so konstruiert ist, daß, sobald die Flasche (3) auf den Halter (2) positioniert wird, der zweite Kappenteil (17b) durch einen Vorsprung (18) am Halter (2) in das Flüssigkeitsreservoir (4) gedrückt wird, so daß die Flasche (3) geöffnet wird und sich die Ausflußöffnung (8) bildet.

### Revendications

1. Bloc de nettoyage et de rafraîchissement (1) muni d'un support (2) et d'une bouteille (3) reliée de façon amovible au support (2) et comprenant un réservoir de liquide (4), ledit bloc (1) étant muni d'un moyen de suspension (5) destiné à suspendre le bloc (1) au rebord d'une cuvette de WC, ledit bloc (1) étant également muni d'une masse d'absorption de liquide poreuse (6) qui communique toujours avec le liquide (F) contenu dans le réservoir de liquide (4), ladite masse poreuse (6) étant disposée dans le support (2) de façon à être située dans le trajet de l'eau de la chasse d'eau lorsque le bloc (1) est suspendu au rebord de la cuvette de WC, ledit support étant muni d'un téton de raccordement (7) convenant à un raccordement avec une ouverture de vidange (8) de la bouteille (3) de sorte que lorsque le bloc (1) est suspendu au rebord de la cuvette de WC, l'ouverture de vidange (8) soit dirigée vers le bas, caractérisé en ce que l'ouverture de vidange (8) de la bouteille (3) lorsqu'elle est reliée est partiellement renfermée par une paroi de fermeture (9) munie d'au moins une ouverture de passage de liquide (10) qui débouche dans un orifice d'entrée (11a) d'un canal (11) rencontrant un orifice de sortie (11b) présentant une surface limitée contre la masse poreuse (6), et muni d'au moins une ouverture d'alimentation en air (12) communiquant avec la pression ambiante, les dimensions de la au moins une ouverture de passage de liquide (10) et de la au moins une ouverture d'alimentation en air (12) étant réglées de telle manière l'une par rapport à l'autre et par rapport à la viscosité du liquide (F) contenu dans le réservoir de liquide (4) que la pression de liquide sur la masse poreuse (6) soit toujours pratiquement égale et indépendante du niveau de liquide dans le réservoir de liquide (4), et en ce que les ouvertures d'alimentation en air (12) communiquent avec la pression ambiante par l'intermédiaire d'une chambre (13) disposée sur une face dirigée vers le haut comportant au moins une ouverture de mise à l'air libre (14).
2. Bloc de nettoyage et de rafraîchissement selon la revendication 2, caractérisé en ce que le volume de la chambre (13) est tel qu'au moins les variations de volume se produisant à la suite des fluctuations de température de l'air contenu dans le réservoir de liquide (4) puissent y être absorbées.
3. Bloc de nettoyage et de rafraîchissement selon l'une quelconque des revendications précédentes, caractérisé en ce que le support (2) est constitué d'une première pièce moulée dont le moyen de suspension (5) fait également partie.
4. Bloc de nettoyage et de rafraîchissement selon au moins les revendications 2 et 4, caractérisé en ce que le téton de raccordement (7), la paroi de fermeture (9), la au moins une ouverture de passage de liquide (10), la au moins une ouverture d'alimentation en air (12), le canal (11), et les parois (15) limitant la chambre (13) font partie d'un second élément moulé raccordé de façon amovible au premier élément moulé par l'intermédiaire d'un raccord à pression (16).
5. Bloc de nettoyage et de rafraîchissement selon la revendication 5, caractérisé en ce que la masse poreuse (6) est fixe entre la première et la seconde pièces moulées.
6. Bloc de nettoyage et de rafraîchissement selon l'une quelconque des revendications précédentes, caractérisé en ce que l'ouverture de vidange (8) de la bouteille (3) est refermée par un bouchon de fermeture (17) muni d'une première partie de bouchon (17a) et d'une seconde partie de bouchon (17b), ladite seconde partie de bouchon (17b) étant d'une conception telle que lorsque la bouteille (3) est placée sur le support (2), ladite seconde partie de bouchon (17b) est comprimée par une saillie (18) disposée sur le support (2) jusqu'à dans le réservoir de liquide (4), de sorte que la bouteille (3) est ouverte et que l'ouverture de vidange (8) est formée.

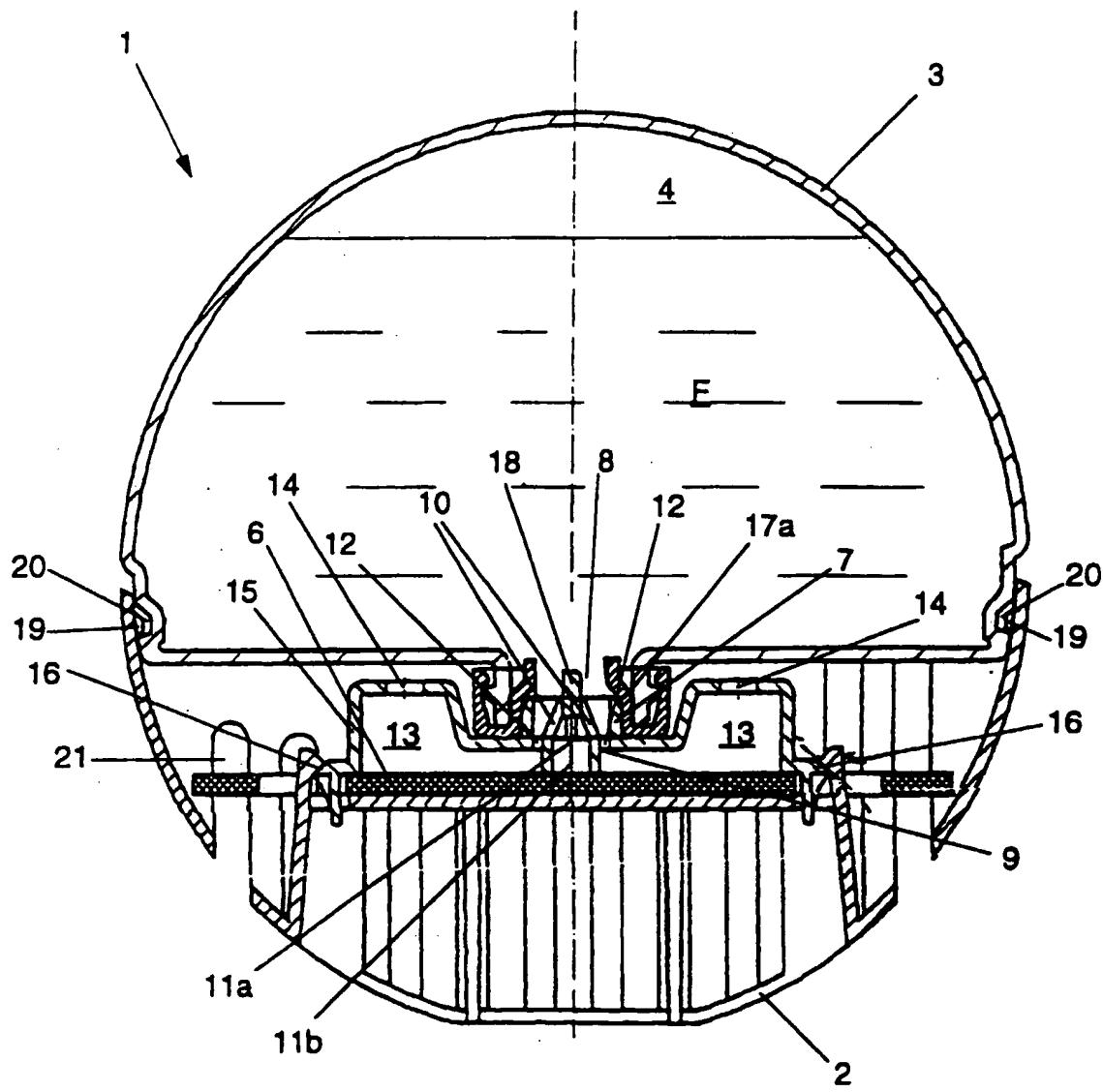


FIG. 1

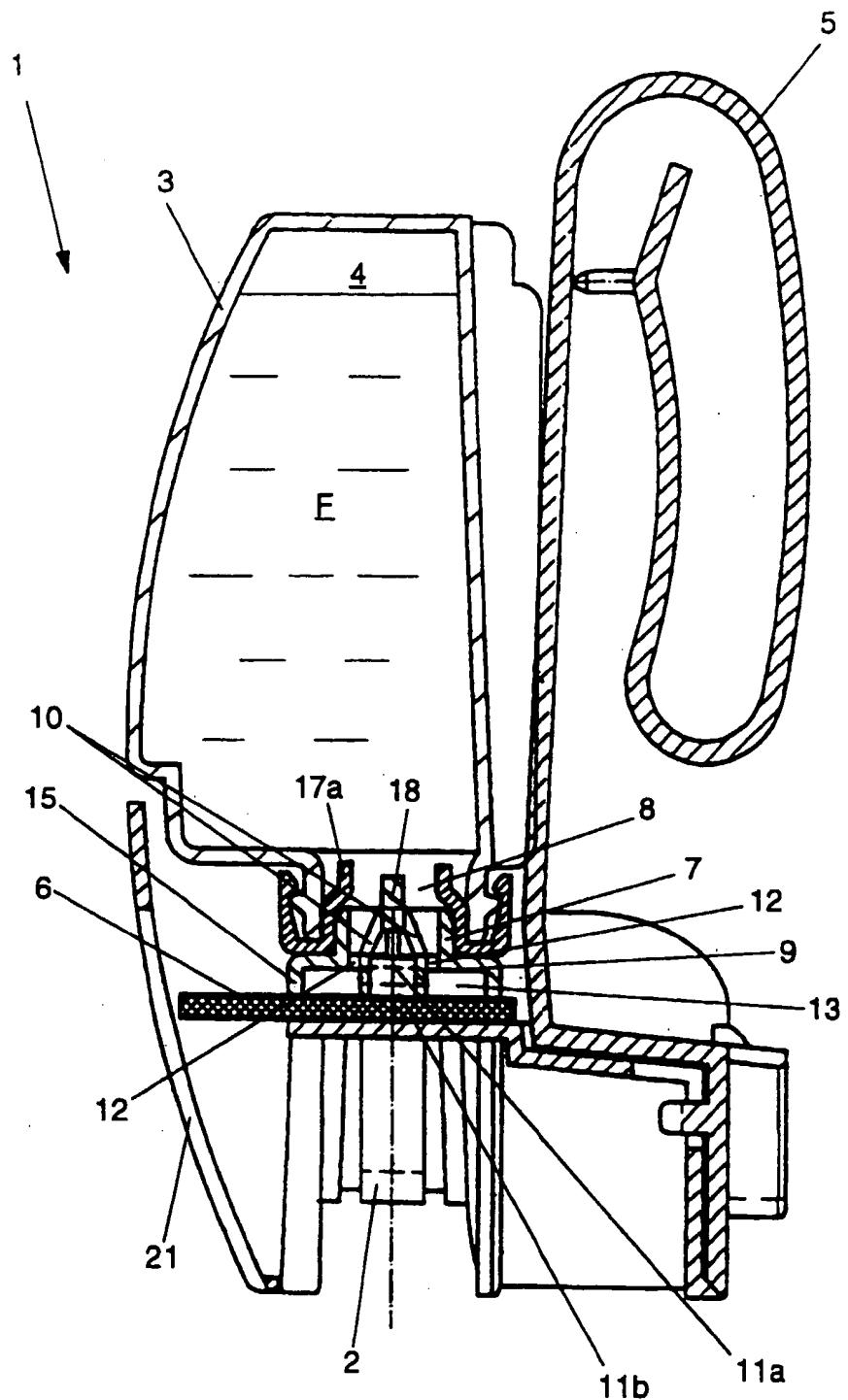


FIG. 2

